

Pedestrian Fatalities on US Highway 666 in New Mexico. Nancy M. Bill, Class of 1988.

SUMMARY

This is a retrospective study which examined twenty-two cases of rural fatal pedestrian collisions for the years 1982 to 1988. Findings revealed two problem sites on U.S. Highway 666 between milemarkers 2.0 to 4.0 where most of the fatal pedestrian collisions occurred. New Mexico led the nation in pedestrian deaths with a rate of 6.27 per 100,000 population compared to the all-U.S. rate of 2.77 deaths per 100,000 population. Pedestrian fatalities have usually been thought of an urban problem affecting primarily the elderly and very young children. However, findings in this study will show the fatal pedestrian collisions were found to have characteristics of a medium age (25-50 years of age) and male. In addition, the lack of adequate illumination of roadway was also a factor in these fatal pedestrian collisions. The driver involved in the pedestrian collision commonly reported "unable to see the pedestrian" and had no time to take evasive action. Other physical evidence noted in the study were the pedestrians' blood alcohol levels indicating intoxication (BACs of 0.05 - 0.5).

The 1987 National Highway Traffic Administration - Fatal Accident Reporting System (FARS) showed 7,828 non-occupant deaths. Pedestrians accounted for 86% of these fatalities.¹ Pedestrians injured or killed in collisions are more often addressed as an urban problem. However, pedestrians are more likely to be killed away from intersections rather than at an intersection. Countermeasures to reduce pedestrian collisions are typically structures (like bridges or tunnels) or striping a designated crosswalk. The purpose is to separate the vehicular and pedestrian traffic.

Rural pedestrian collisions have not been given adequate attention in initiating safety countermeasures. Laws pertaining to pedestrians on highways have been accepted to separate people from traffic. The greatest proportion of pedestrians killed are reported to occur on principal arterial roads. New Mexico's pedestrian collision experience differs from other rural states. The New Mexico Traffic Safety Bureau summarizes a 20-year trend (1963 - 1982) showing an increase of 117% in pedestrian fatalities. Two rural counties located in the Northwest section of New Mexico account for more than 21% of the pedestrian fatalities. The pedestrian accident fatality index in these counties is 0.26, twice the value for the rest of New Mexico.² The two adjacent counties, McKinley and San Juan, have similar pedestrian characteristics which show occurrence at non-intersections, the hours of darkness, and alcohol involvement. Statistics from the New Mexico Traffic Safety Bureau reveal that these two counties have a disproportionate share of the pedestrian collisions.

Pedestrian injuries and fatalities are usually associated with an urban populated environment. Nationally, pedestrian injuries and fatalities affect the very young (<10 years of age) and those over 55 years of age. Furthermore, these pedestrian injuries and deaths occur when the person is crossing or entering a street. More than one third of these occur between intersections.

A relatively higher than usual rate of fatal pedestrian collisions occurring on U.S. Highway 666 have been documented by reports from the New Mexico State Traffic Safety Department. This study examined all pedestrian fatalities during the years 1982 - 1988, which occurred between milemarkers 0.5 - 8.0 on U. S. Highway 666.

METHODS

This paper reviews six years (1982 - 1988) of rural pedestrian fatality data. The data covers pedestrian collisions which occurred on U. S. Highway 666 within the McKinley County boundaries. U.S. highway 666 is a north/south four-lane highway located north of Gallup, New Mexico. The study site was limited

to milemarkers 0.5 to 8.0 on the U. S. Highway 666. Two particular areas were identified as problem sites where 63 percent of all the fatalities occurred. These sites include milemarkers 2.0 and 4.0.

A review of police reports and narratives; medical examiner's investigation summaries; the New Mexico Transportation Department Traffic Safety Bureau's records; interviews with Law Enforcement Officers and medical officials; and site-investigations were used to determine problem sites and variables associated with the fatalities. Information obtained from these sources allowed for a profile to be developed of the pedestrian and driver involved in the collision. The characteristics of the individual pedestrian and driver were analyzed to assist in identifying contributing factors.

Additional factors included in this review were the environmental characteristic of the roadway (e.g., lighting); weather conditions; time of day; date of incidence; direction of travel of vehicle and pedestrian; and vehicle model and type.

TRAFFIC FLOW CHARACTERISTICS: The U.S. Highway 666 is a north-south bound four-lane divided route. There is no street lighting in either direction. US 666 is a major route between a city (20,000 population) and an Indian Reservation (200,000 population). The highway serves as an additional through-way for three adjacent states. The traffic flow is constant throughout the day time. "Rush hours" were observed during 7:00 AM to 8:00 AM and 4:30 PM to 6:00 PM. The weekend traffic flow to and from the city results in a tremendous increase. The city serves as a main shopping center for the Indian reservation residents.

PEDESTRIAN TRAFFIC. DAYTIME HOURS: Pedestrian traffic along U.S. Highway 666 can be found at all hours during the day. It is increased during warmer weather. The pedestrians observed in the daylight hours were mostly men; however women, children and teenagers were also present on the highway. The pedestrians either were walking with the direction of traffic or were standing or sitting on the northbound shoulder of the roadway. The majority were concentrated in the areas between milemarkers 0.5 and 4.0.

EVENING AND DARK HOURS: The pedestrians observed during the evening and dark hours were mostly young (>18 years of age) to older males and females. These pedestrians were walking with the direction of the north-bound route or attempting to cross from east to west. Southbound pedestrians were also present between milemarkers 0.5 and 4, walking towards the city.

HIGHWAY CHARACTERISTICS: The overall route appeared to have adequate daylight sight distance with wide shoulders. Previous site investigations by Dr. Jerold Hall, Civil Engineer, reported this route to have more than adequate daytime sight distance with an excess of 1000 ft. (which exceeds the AASHO standards) and no roadside hazards (fixed roadside objects). Dark or night time observations between milemarker 0.05 to 8.0 had little or no sight distance. No street lights are present from 0.05 to 8.0.

HIGHWAY SPEED LIMIT AND WARNING SIGNS: The posted speed limit on U.S. Highway 666 is 55 mph. "PEDESTRIAN" warning signs are posted at the northbound lane at milemarkers 2.3 and 3.7. The southbound route has warning signs at milemarkers 4.3 and 2.5.

RESULTS

A total of twenty-two fatal pedestrian cases were reviewed for the years 1982 - 1988. The trend of the pedestrian fatalities occurred frequently and were confined to particular sites along a four-mile stretch of highway. Sixty-three percent of the twenty-two cases occurred at or near milemarkers 2.0 and 4.0.

Eight (36%) of the fatal pedestrian collisions occurred at milemarker 2.0. Six (27%) of the pedestrian collisions occurred at milemarker 4.0. The remaining eight (36%) were distributed between milemarker 1.0 and 8.0. No pedestrian collisions occurred at milemarker 6.0.

In the study period, the years 1983 and 1985 experienced the highest pedestrian fatalities. In 1983, there were three fatalities with two at milemarker 2.0 and one at milemarker 4.0. 1985 had a total of five fatalities with three at milemarker 2.0 and two at milemarker 4.0. In 1988, there were no pedestrian collisions at milemarker 2.0; however, two pedestrian fatalities occurred at milemarker 4.0 (Table 1).

Table 1
Fatal pedestrian collisions
at milemarkers 2.0 AND 4.0

<u>YEAR</u>	<u>MM2.0</u>	<u>MM4.0</u>	<u>TOTAL</u>
1982	0	1	1
1983	2	1	3
1984	1	0	1
1985	3	2	5
1986	1	0	1
1987	1	0	1
1988	0	2	1
TOTAL		8	6

MILEMARKER 2.0 - January and November experienced the most fatalities. All others occurred during the months of February, June, August and September..

MILEMARKER 4.0 - The month of August had the most fatalities while others occurred during April, June, July and September.

No pedestrian fatalities occurred during the months of March, May, October and December.

WEATHER CONDITIONS: Weather conditions were not a contributing factor in all fourteen cases. Clear weather conditions were reported by the investigating officers. 21 percent of the fatal pedestrian collisions occurred in the month of August.

PEDESTRIAN ACTIVITY AT TIME OF COLLISION:

Milemarker 2.0: Fifty-percent of pedestrians were reported as crossing the highway from the east to west direction. Two-percent were walking towards the city (from the north to south direction). One person was crossing from the west to east direction. Another person was walking from the south to north direction.

Milemarker 4.0: Fifty-percent were crossing from the east to west direction. Two were crossing from the west to east direction. One was standing in the roadway.

DAY AND TIME OF WEEK: 30% of the fatalities occurred on Thursday and 23% on Friday.

Time of day was an apparent factor in the pedestrian fatalities with majority occurring during the dark hours of 17:00 and 06:00 hours. Fifty percent occurred between 17:00 and 23:00 hours. Thirty-two percent occurred between 01:00 and 06:00 hours.

PEDESTRIAN CHARACTERISTICS: Color of clothing was a contributing factor in the nighttime hours. All of the pedestrians were reported to have been wearing dark to dark blue clothing at the time of collision.

AGE: Age ranged from 25 to 50 years of age.

ALCOHOL USE: Alcohol intoxication was a major factor in these cases. A blood alcohol test were performed on the deceased by the New Mexico Office of Medical Investigator. The tests revealed blood alcohol concentrations (BACs) ranging from 0.05 to 0.50 in all of the pedestrians. An interesting observation: while pedestrian victims were always tested for alcohol use, drivers of implicated vehicles were not tested.

CONCLUSIONS

The number of pedestrian fatalities occurring on U.S. Highway 666, between milemarkers 0.05 and 8.0 is very significant. Pedestrian injuries and fatalities usually are more apparent in an urban setting. However, the nature of these fatal collisions with pedestrians shows a serious problem for a rural setting. The rural pedestrian collisions have not been given the attention in initiating safety countermeasures. While laws pertaining to pedestrians on major interstates or highways have been accepted to keep people separate from traffic, rural roadways have not received the same attention.

CHANGE BEHAVIOR AND LAWS: Alcohol intoxication was certainly a contributing factor in all the cases. However, dealing with this problem of an intoxicated pedestrian involves enforcement and regulation. Targeting this problem requires action in reviewing the sale of alcohol, its distribution, and open-container regulations.

ENFORCEMENT: Policies regarding pedestrians on roadsides are unclear and need further study. The enforcement of picking up intoxicated individuals poses a problem for state, county and city entities. Strict enforcement to clear intoxicated pedestrians from the roadside requires constant monitoring.

ENVIRONMENTAL: All of the pedestrian fatalities occurred during the dark and late hours. The majority of the drivers involved in these collisions stated they were "unable to see the pedestrian". No fatal pedestrian collisions occurred during the daylight hours. Given the amount of increased pedestrian traffic during daylight hours in the absence of any fatal pedestrian collisions, the need for adequate lighting at night becomes obvious.

RECOMMENDATIONS

- (1) Install street lighting from milemarker .005 to 4.0 on U.S. Highway 666. Adequate illumination for evening and night hours would assist drivers in avoiding pedestrians (whether impaired or not).
- (2) Conduct further studies regarding the enforcement of efforts to remove intoxicated pedestrians from roadsides.

REFERENCES

1. Fatal Accident Reporting System (FARS). National Highway Traffic Administration, 1987.
2. Graff H: "Pedestrian Study, 1963-1982". NM Transportation Department, Traffic Safety Bureau. 1985.
3. Hall JW: " Pedestrian Accidents in New Mexico", University of New Mexico, College of Engineering. 1998.